The use of Ikonos-2 image for landslides mapping on Stromboli

Geophysical Research Abstracts, Vol. 7, 03393, 2005
SRef-ID: 1607-7962/gra/EGU05-A-03393

The use of Ikonos-2 image for landslides mapping on Stromboli

N. Casagli (1), L. Guerri (1), **P. Farina** (1) G. Righini (1), D. Tarchi (2)

(1) University of Firenze, Earth Sciences Department, Firenze, Italy, (2) IPSC/HSU unit, Joint Research Centre, Ispra (VA), Italy

The potential of remote sensing for the monitoring of the Earth environment and the detection of its temporal variations is well known. New generation very high resolution (VHR) satellite imagery (IKONOS, Quickbird) could provide a powerful tool for quickly production of regional cartography at scale 1:2000, with a relative low cost/benefit ratio. On December 2002 Stromboli modified its typical strombolian activity producing lava flows channeled within its steep NW flank, known as Sciara del Fuoco, and on December 30th a big landslide occurred on the Sciara, falling into the sea and producing a tsunami. In the framework of an extensive monitoring system set up by National Civil Protection Department (DPC) on the volcano an Ikonos-2 image, dated 29 April 2003, was acquired, processed and photointerpreted for updating landslides map. In order to improve visual interpretation of the optical data, standard radiometric image processing was carried out on the multispectral bands for contrast enhancement; furthermore multispectral bands were merged with the panchromatic one in order to obtain a final multispectral image of 1 m spatial resolution. Photointerpretation of landslides and different features was then performed: ridges, valleys and morphological aspects were clearly evident and land cover information, such as vegetation, soils, rock outcrops, were also visible. The image was overlaid on a Digital Terrain Model (DTM) of 5 m resolution and 3D perspective view was obtained. The results achieved using the Ikonos imagery were very promising as the 1 m spatial resolution allows even small mass movements to be mapped: new landslides were identified and classified regarding typology and state of activity; in particular on the Sciara del Fuoco different portions and escarpments of the big landslides occurred on the 30th December 2002 were mapped. Furthermore using these information, DPC was able to map out new tracks to the top of the volcano.